

# The Common Operational Picture

*The Coast Guard's window on the world.*



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The Coast Guard common operational picture (COP) is primarily a tool for achieving situational awareness of what is transpiring in the Maritime Domain. The COP is "common" because the same information is shared across computer networks and available for display in all Coast Guard command centers and mobile assets. "Operational" because the information displayed is relevant to U.S. Coast Guard (USCG) operations and is used to facilitate command and control and decision making. The COP is a "picture"

because the information is presented on an interactive digital map.

Technically the COP is a display of relevant information shared by more than one command. It provides a shared display of friendly, enemy/suspect, and neutral tracks on a chart, with geographically referenced overlays and data enhancements. The common operational picture contains a decision-maker toolset, fed by track and object databases. Each user can filter and

contribute to these databases according to his or her area of responsibility or command role.

The common operational picture environment includes distributed data processing, data exchange, collaboration tools, and communications capabilities. The COP may include information relevant to the tactical and strategic levels of command, such

## COP Overview



### **COP Feeds Include**

- NOAA Vessel Monitoring Service;
- Inland Rivers Vessel Movement Center;
- Sector command centers;
- Port and waterways safety systems;
- Vessel traffic systems in Puget Sound, Houston/Galveston, San Francisco;
- Automatic identification systems;
- Alaskan maritime exchange;
- Blue force reporting;
- Department of Defense partners.

### **COP Outputs**

Agencies/entities that have used or provide information into the USCG Common Operational Picture within the past year include:

- National Geospatial Agency;
- National Security Agency;
- Department of Defense;
- Joint Interagency Task Force South;
- The White House;
- Secret Service;
- Defense Information Service Agency;
- Port Authority New York;
- Port Authority Boston;
- Police Department New York;
- Police Department Boston;
- Civil Authorities Seattle;
- Civil Authorities New Orleans;
- FEMA; and
- the National Guard Bureau.

### **COP Data Exchange**

The COP is updated with continual exchanges of data with:

- DOD Northern Command,
- DOD Southern Command,
- DOD Pacific Command,
- DOD National Geospatial-Intelligence Agency,
- DHS Homeland Security Operations Center.

as geographic information systems data, assets, activities and elements, planning data, readiness data, intelligence, reconnaissance and surveillance data, imagery, and environmental data.

### **Why Does the Coast Guard Need a COP?**

Maritime Domain Awareness (MDA) improvements have exponentially increased the quantity of disparate data sources available to USCG decision makers. These new data sources include ports and waterways coastal surveillance sensors for sector command centers, Secure Ports Initiative/Command 2010 systems, automated identification system (AIS) feed upgrades to the underlying USCG communications infrastructure, and improved mobile asset sensors at sea and in the air. The sheer volume of this information requires a common mechanism to view it all and make sense of it.

The COP enhances Maritime Domain Awareness and serves as a decision-making aid for field commanders. The common operational picture is shared with the intelligence community, who can add value to the picture. Intelligence may designate targets as being of interest or even hostile, with supporting remarks as to why. Once intelligence or a command center makes this determination, the change is reflected across all of the common displays. Developments in the COP include the ability to display layers of geospatial information system (GIS) data, such as critical infrastructure, hospitals, road networks, as well as weather information.

### **What is in the COP?**

At its core, the COP is a geographic display that contains position and amplifying information about contacts (called tracks). Tracks in the common operational picture are discovered by various sensor sources. The COP provides the network infrastructure to exchange, share, and manipulate the track data. The databases containing the tracks and amplifying information are common to all viewers and are fed by various sensor inputs, which include automatic identification systems, sector command center radars, vessel tracking systems, and many Department of Defense (DOD) data feeds and sensor sources. The COP will also display positions of our own forces (blue force tracking) of cutters, boats, and aircraft.

A Coast Guard user can tailor the COP to show specific areas and approaches. Other government agency tracks can be displayed in the common operational picture if they are outfitted with tracking and reporting devices. For example, FEMA units were equipped

with satellite-based tracking devices after Hurricane Katrina, displayed in the USCG unclassified COP view.

The COP is comprised of:

- **Command and control systems:** The hardware used to collect, fuse, disseminate, and store information for the COP. This category includes the associated networks and facilities to house the systems.
- **Track data feeds:** Tracks are the essence of the common operational picture. They display the location of particular vessels, aircraft, or land resources. The feeds originate from the Coast Guard as well as from other government agencies and civilian sources.
- **Information data sources:** These sources provide additional value and context to the track data, which gives the operational commander information about why a track is important. Sources include intelligence inputs and Coast Guard databases, such as the Maritime Information System for Law Enforcement and Ships Arrival Notification System.
- **COP management procedures:** These procedures are being developed by the COP working group. They include a concept of operations, requirements document, and standard operating procedures. For example, how we use the COP; agreements with others on sharing and exchanging information with USCG; the rules for how data is correlated; and how data is flagged as threats, friends, etc.

#### Command and Control Systems of the COP

USCG utilizes the DOD global command and control system (GCCS) as the foundation for the common operational picture. The GCCS is a system of record that is deployed in every major Coast Guard command center. It provides the network tools to synchronize each individual command center's track database into a CG-wide COP, while also allowing the individual command centers to tailor their picture to their own specific needs.

The global command and control system also enables information sharing and interoperability with DOD, which is the primary external supplier of common operational picture track data. USCG recently completed migration of all GCCS-J 3.0 servers to GCCS 4.0, which keeps us in lock-step with DOD advances in the COP program of record.

GCCS provides the core track database exchange mechanism for COP, but there are other command and control systems used to inject, exchange, display, or manipulate common operational picture information, including:

- shipboard command and control systems,
- command and control personal computers,
- Deepwater Coast Guard command and controls, and
- CG WebCOP (in development).

#### The Coast Guard's Sensitive but Unclassified COP

Realizing most Coast Guard users do business at the sensitive but unclassified (SBU) level, and most COP data sources available to USCG are also gathered at the SBU level, the Coast Guard began development of an SBU COP. Working in 2003 with Joint Forces Command Project Echo Spiral, Coast Guard's Command and Control Engineering Center (C2CEN) proved the concept of moving unclassified track data with DOD GCCS systems within a sensitive but unclassified network. C2CEN expanded the common operational picture architecture to mirror the established classified side of common operational picture, with a similar network of computers on the SBU side.

All data feeds on the sensitive but unclassified common operational picture network are pushed through a high-assurance guard, to be available to the classified side for COP data sharing with the Department of Defense. Today the CG SBU COP is deployed and accessible everywhere the classified common operational picture is. Users at the port level can access the SBU COP from their parent district gateway.

The Coast Guard's unique development of a sensitive but unclassified common operational picture permits information sharing within and external to DHS, without the constraints inherent to classified Department of Defense systems.

#### CG WebCOP

CG WebCOP will be an internet browser-based viewer of common operational picture data available to all Coast Guard users and select port partners. Active engineering development is ongoing and testing is presently occurring on a USCG Intranet version of CG WebCOP. CG WebCOP will include Coast Guard-unique features including vessel profiling, reachback to CG databases such as MISLE, video camera feeds, and collaboration tools (chat) capability.



## Looking Ahead

The U.S. Coast Guard is leading the way for DOD and Department of Homeland Security (DHS) interoperability by building a common operational picture from data sources uniquely available to the Coast Guard. Increasingly, USCG has received requests to support interagency and DOD efforts in the homeland security mission space by providing USCG common operational picture data.

Future developments in the USCG COP include improving the status of Coast Guard assets reported as "blue forces" in the common operational picture, which adds value and intelligence to each contact in the COP; improving the ability to share common operational picture data at both the unclassified and classified levels; and making COP tools more user-friendly through initiatives like CG WebCOP.

Development and deployment of new systems under the major USCG Deepwater program are also expected to field improved capability that can leverage existing USCG COP architecture.

The U.S. Coast Guard common operational picture exists today and is an integral tool for executing a variety of USCG missions. The CG COP promotes Maritime Domain Awareness to enable operations including fisheries enforcement, counter-drug operations, search and rescue, vessel traffic services, and Captain of the Port security operations.

Increasingly, USCG has received requests to support interagency and DOD efforts in the homeland security mission space by providing USCG common operational picture data and expertise. As the data sources grow, with increased sensor and surveillance capability in each port and mobile asset, the CG common operational picture will become more robust and Maritime Domain Awareness will be greatly amplified.

### About the Author:

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## Read All About it

More information on the USCG casualty investigations profiled in the summer 2006 edition of Proceedings is available online at: <http://www.uscg.mil/hq/g-m/moa/reportindexcas2.htm#mi>.

*"Investigation into the Circumstances Surrounding the Allision of the M/V Anne Holly with the Eads Bridge and Subsequent Allision with the Admiral Casino, in St. Louis Harbor, Missouri, on 04 April 1998, with Multiple Injuries and no Loss of Life." LT Dennis Branson, investigating officer.*

*"Supplemental Report on the Disappearance of the Commercial Fishing Vessel Linda E (O.N. 236906), with Three Crewmembers Near Port Washington, WI, on Lake Michigan on December 11, 1998." B. R. Emond, investigating officer.*

*Joint—Maritime Investigator Oslo, Norway, United States Coast Guard Report of "Investigation into the Circumstances Surrounding the Grounding of the Monarch of the Seas on Proselyte Reef in Great Bay, Philipsburg, St. Maarten, Netherlands Antilles on December 15, 1998, Resulting in Major Vessel Damage, no Loss of Life and Minor Pollution." Investigating Officers Finn Paulrud, Oslo; Timothy J. Farley U.S. Coast Guard.*

*"Investigation into the Circumstances Surrounding the Commercial Diving Accident Onboard the Mobile Offshore Drilling Unit Cliff's Drilling Rig No. 12 on March 4, 1996, with the Loss of Life." LT Casey Plagge, investigating officer.*

*"Investigation into the Circumstances Surrounding the Loss of the Commercial Fishing Vessel Cape Fear Three NM SW of Cuttyhunk, Massachusetts on January 9, 1999, with the Loss of Two Lives." CAPT G.R. Matthews, investigating officer.*

*"Investigation into the Circumstances Surrounding the Loss of the Commercial Fishing Vessel Beth Dee Bob O.N. 960023 15 NM East of Manasquan, N.J., on January 6, 1999, with the Loss of Four Lives." CDR M. Kearney, investigating officer.*

*"Investigation into the Circumstances Surrounding the Incident Involving MC00002219-FV Two Friends on 01/25/2000." LCDR John E. Cameron, investigating officer.*

*"Investigation into the Circumstances Surrounding the Explosion, Fire and Sinking of the Uninspected Fish Processing Vessel Galaxy Official Number 576981, in the Bering Sea on October 20, 2002, With Two Persons Deceased and One person Missing and Presumed Dead." LCDR Chris Woodley, investigating officer.*

*"Investigation into the Circumstances Surrounding the Engine Room Fire on Board the M/V SSG Edward A. Carter, Jr. While Moored at Ocean Terminal Sunny Point, N.C. on July 14, 2001 with the Loss of Two Lives." MSS4 Kenneth Raifsnider, investigating officer.*

*"Investigation into the Circumstances Surrounding the Allision Between the Barge Tow of the M/V Brown Water V and the Queen Isabella Causeway Bridge on September 15, 2001, in Port Isabel, Texas, Resulting in Multiple Loss of Life." James Wilson, investigating officer.*

## Champion's Note: Future COP is UDOP

Today's COP is an effective tool to disseminate MDA information to operational commanders and decision makers. As we continue to develop a world-wide MDA community, the volume of information community members will need to share and access will prevent "pushing" an entire picture to each. Aside from being wasteful, the need for bandwidth would be unimaginable. Additionally, each member of any community has unique requirements for what each needs to "see" and understand in the mission and geographic areas. The next generation of disseminating this kind of information calls for all members of the community to "publish," or reveal the information they hold. At the same time members "subscribe" to, or access the databases of others in order to assemble their own User-Defined Operational Picture (UDOP). All of this is based upon permissions and certifications in order to properly safeguard classified and proprietary information and ensure that community members only access information to which they are entitled. Structuring these data sets in a service oriented architecture (SOA) allows for these kinds of exchanges and is essential for development of UDOPs and the next generation of information sharing. This is the methodology being used by the MDA Data Sharing Community of Interest (see related article). Look for much more focus on SOA and UDOPs in MDA and other IT endeavors in the years to come.